July 31, 1995
GFK-0871C

IMPORTANT PRODUCT INFORMATION

READ THIS INFORMATION FIRST

Product: Host Communications Software

IC641SWP052D - Toolkit for Windows™ C / C++ Applications	Release diskette 1.03 HCT Version 1.15 Sample C Programs, Version 1.06
IC641SWP054B - Toolkit for HP-UX C Applications	Release diskette 1.03 HCT Version 1.04 Sample C Programs, Version 1.01
IC641SWP058B - Toolkit for Windows NT™ C / C++ Applications	Release diskette 1.03 HCT Version 1.02 Sample C Programs, Version 1.01
IC641SWP053B - Toolkit for DEC VAX / VMS™ C Applications IC641SWP057B - Toolkit for DEC Alpha AXP / VMS™ C / C++ Applications	Release diskette 1.01 HCT Version 1.01 Sample C Programs, Version 1.01
IC641SWP055B - Toolkit for Windows VisualBasic™ Applications	Release diskette 1.01 HCT Version 1.08 Sample Basic Programs, Version 1.01
IC641SWP050D - Host Communications Drivers for Windows (qty. 1) IC641SWP051D - Host Communications Drivers for Windows (qty. 10)	Release diskette 1.05 TCP / IP driver, Version 1.08 VME driver, Version 1.05

The Host Communications software provides a means to communicate to a IC697 PLC through its Ethernet Interface (IC697CMM741) or to a IC693 PLC through its Ethernet Interface (IC693CMM321). The Host Communications software can be used to develop applications which run on one of the following host computers: an HP-UX 9000 workstation, a PC running Microsoft® Windows™ for Workgroups, a PC running Microsoft® Windows NT™, a DEC VAX / VMS™ workstation, or a DEC Alpha AXP / VMS™ workstation. The host-to-PLC communications uses TCP / IP (Transmission Control Protocol and Internet Protocol) across an Ethernet Local Area Network (LAN) or a direct connection to a Series 90-70 VME bus.

New For This Release

This Host Communications software release consists of the following:

1. Upgrade to all Host Communication Toolkits and Host Driver catalog numbers (except IC641SWP055) to add support for TCP / IP Ethernet for IC693 PLCs.
2. Addition of a "C" compiler library to the existing C++ compiler library for the DEC Alpha AXP / VMS platform (IC641SWP057).
3. Addition of a "trace debug" library for the HP-UX 9000 (IC641SWP054), DEC VAX / VMS (IC641SWP053), and DEC Alpha AXP / VMS (IC641SWP057) platforms. See below for more details.
4. Addition of "tallies" to all platforms (except IC641SWP055). See the section "Special Operational Notes" for more details.

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™ Windows and Windows NT are trademarks of Microsoft Corporation.
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5. Logical names now allowed for the GEF_CFG.INI file on the HP-UX 9000 (IC641SWP054), DEC VAX / VMS (IC641SWP053), and DEC Alpha AXP / VMS(IC641SWP057) platforms. See below for more details.
6. Addition of PLC checksum information to the CTLINFO structure. See the user's manual additions below for more details.
7. Addition of support for the HCT_cancel_request interface routine on the HP-UX (IC641SWP054) platform. This routine allows the user to cancel an outstanding request made using the non-blocking calling style. Refer to GFK-0870 for further description of this routine.

General Description of Host Communications Software Products

- ***Toolkit for Windows C/C++ Applications*** (IC641SWP052) is a runtime toolkit which allows Microsoft Windows user-written C or C++ applications to access data from IC697 and IC693 PLCs. This catalog number requires and includes one copy of the *Host Communications Drivers for Windows* (IC641SWP050).
- ***Host Communications Drivers for Windows*** (quantity one - IC641SWP050, quantity 10 - IC641SWP051) contains an interface between the TCP / IP or VME communications software below and the *Toolkit for Windows C/C++ Applications* or the *Toolkit for Windows Visual Basic Applications* above. The IC641SWP050 catalog number includes one runtime license. The IC641SWP051 catalog number includes ten (10) runtime licenses. The IC641SWP051 product is provided as a convenience to users requiring use of the Host Communications software on multiple platforms.
- ***Toolkit for HP-UX C Applications*** (IC641SWP054) is a runtime toolkit and interface to the HP TCP / IP driver which allows user-written C applications on a Hewlett Packard HP-UX 9000 workstation to access data from IC697 and IC693 PLCs. This catalog number includes one runtime license (GFJ-0317).
- ***Toolkit for Windows* NT C/C++ *Applications*** (IC641SWP058) is a runtime toolkit which allows Microsoft Windows NT user-written C or C++ applications to access data from IC697 and IC693 PLCs. This product does not require additional drivers as does IC641SWP052. This catalog number includes one runtime license (GFJ-0317).
- ***Toolkit for Windows Visual Basic Applications*** (IC641SWP055) is a runtime toolkit which allows Microsoft Windows user-written Visual Basic applications to access data from IC697 PLCs. This catalog number requires and includes one copy of the *Host Communications Drivers for Windows* (IC641SWP050).
- ***Toolkit for DEC VAX/VMS C Applications*** (IC641SWP053) is a runtime toolkit and Interface which allows user-written C programs on a DEC VAX / VMS workstation to access data from IC697 and IC693 PLCs. This catalog number includes one runtime license (GFJ-0317).
- ***Toolkit for DEC Alpha AXP/VMS C/C++ Applications*** (IC641SWP057) is a runtime toolkit and Interface which allows user-written C or C++ programs on a DEC Alpha AXP / VMS workstation to access data from IC697 and IC693 PLCs. This catalog number includes one runtime license (GFJ-0317).

Compatibility

The Visual Basic Windows Toolkit (IC641SWP055) and the C / C++ Windows Toolkit (IC641SWP052) can operate simultaneously on the same machine.

Compatibility with IC697 PLCs

The TCP / IP Host Communications software is compatible with the following:

Factory LAN Ethernet Controller firmware	Requires Factory LAN Ethernet Controller (IC697CMM741), firmware version 1.15 or later.	(U70) 388-003F1.15 (U71) 388-004F1.15 Field upgrade kit number 44A731219-G04
Factory LAN TCP / IPEthernet software	Requires FactoryLANTCP / IP Ethernet software (IC651ENS042), version 1.28 or later.	IC651ENS042
IC697 PLC CPU firmware	Requires IC697 PLC CPU firmware, version 4.12 or later.	

The new VME Host Communications Driver operates only on a Series 90-70 Plug-and-Play PC (IC697VPC462, IC697VPC463, IC697VPC464, and IC697VPC494).

Compatibility with IC693 PLCs

The TCP / IP Host Communications software is compatible with the following:

Factory LAN Ethernet Interface firmware	Requires Factory LAN Ethernet Interface (IC693CMM321), software version 1.00 or later.
IC693 PLC CPU firmware	Requires IC693 PLC CPU firmware, version 5.03 or later (6.03 or later for CPU351).

Toolkit Programming Languages and Host Operating System Requirements

As stated before, the Host Communications Toolkit runs on various platforms. The table below shows the specific programming languages that can be used to write Host Communications Toolkit applications on a particular platform as well as the host operating system requirements.

Platform	Programming Language	Operating System Requirements
Microsoft Windows	Microsoft C 7.0, Microsoft Visual C++ 1.00 or later., or Visual Basic 3.00 or later	Windows for Workgroupsv3.11
Microsoft Windows NT	Microsoft 32-bit Visual C / C++ compiler	Windows NT v3.5
HP-UX	Native“cc”compiler	HP-UX v9.0 with Berkley sockets
DEC VAX / VMS	VAX C compiler	VMS 5.5-2, DEC TCP / IP for Open VMS v3.2
DEC Alpha AXP / VMS	Alpha C compiler (CC), version 4.1 or Alpha C / C++ compiler (CXX), version 1.3	VMS 6.0, DEC TCP / IP for Open VMS v3.2

Product Documentation

Catalog Number	Platform	Documentation
IC641SWP052	Microsoft Windows	*Host Communications Toolkit for C/C++ Applications User's Manual*, GFK-0870A *Host Communications Drivers for Microsoft Windows User's Manual*, GFK-1026A
IC641SWP055	Microsoft Windows	*Host Communications Toolkit for Visual Basic Applications User's Manual*, GFK-1063A *Host Communications Drivers for Microsoft Windows User's Manual*, GFK-1026A
IC641SWP054	HP-UX	*Host Communications Toolkit for C/C++ Applications User's Manual*, GFK-0870A
IC641SWP058	Microsoft Windows NT	*Host Communications Toolkit for C/C++ Applications User's Manual*, GFK-0870A
IC641SWP053	DEC VAX / VMS	*Host Communications Toolkit for C/C++ Applications User's Manual*, GFK-0870A
IC641SWP057	DEC Alpha AXP / VMS	*Host Communications Toolkit for C/C++ Applications User's Manual*, GFK-0870A
IC641SWP050 IC641SWP051	Microsoft Windows Microsoft Windows	*Host Communications Drivers for Microsoft Windows User's Manual*, GFK-1026A

Operational Notes

Runtime License Required per System

Each Toolkit catalog number (IC641SWP052, IC641SWP053, IC641SWP054, IC641SWP055, IC641SWP057, and IC641SWP058) comes with a Runtime License. This license is the standard license required to use GE Fanuc software products (GFJ-0317), much like the license Microsoft requires to use Word for Windows on a PC. The Runtime License included with the Toolkit allows the user to run the Host Driver software on a single machine only.

For the Windows environment, the user wanting multiple PCs to run this software may purchase IC641SWP050 to get the Host Driver support software and a Runtime License (GFJ-0317) for a single machine, or IC641SWP051 to purchase ten (10) Runtime Licenses and software. For HP-UX, Windows NT, DEC VAX / VMS, and DEC Alpha AXP / VMS environments, one runtime license (IC641LCN054 for HP-UX, IC641LCN058 for Windows NT, IC641LCN053 for DEC VAX / VMS, and IC641LCN057 for DEC Alpha AXP / VMS) per system is required. The following table summarizes the licenses, catalog numbers, and manuals associated with the Host Communications software products.

Catalog Number	Platform	User's Manual	Hours of Telephone Support	Runtime License Included
IC641SWP052	Microsoft Windows	GFK-0870A,GFK-1026A*	ten (10)	GFJ-0317*
IC641SWP055	Microsoft Windows	GFK-1063A,GFK-1026A*	five (5)	GFJ-0317*
IC641SWP058	Microsoft Windows NT	GFK-0870A	ten (10)	GFJ-0317
IC641SWP054	HP-UX	GFK-0870A	twenty-six (26)	GFJ-0317
IC641SWP053	DEC VAX / VMS	GFK-0870A	twenty-six (26)	GFJ-0317
IC641SWP057	DEC Alpha AXP / VMS	GFK-0870A	twenty-six (26)	GFJ-0317
IC641SWP050	Microsoft Windows	GFK-1026A	N / A	GFJ-0317
IC641SWP051	Microsoft Windows	GFK-1026A	N / A	Ten copies of GFJ-0317
IC641LCN058	Microsoft Windows NT	N / A	N / A	GFJ-0408, GFJ-0317
IC641LCN054	HP-UX	N / A	N / A	GFJ-0405, GFJ-0317
IC641LCN053	DEC VAX / VMX	N / A	N / A	GFJ-0406, GFJ-0317
IC641LCN057	DEC Alpha AXP / VMS	N / A	N / A	GFJ-0407, GFJ-0317

* - part of IC641SWP050, which is included in this catalog number

HP-X Toolkit Can Work With "xdb" Debugger

As noted in Engineering Problem Report #29942 (see Problems Corrected in HP-UX Toolkit, below), there is a problem running the *Toolkit for HP-UX C Applications* (IC641SWP054) using the non-blocking event-driven calling style while also using the HP-UX "xdb" X-Windows debugger program. In particular, events would not get passed to the HCT application. The solution is for the user to take two additional steps when running the HCT with xdb:

1. In the HCT application, make a call either to *setsid()* or to *setpgrp()* before the first HCT call. This puts your process at the top of the process list. Note that this also requires that your application include *unistd.h*.
2. Before the *run* command is given or before the program accesses the network, enter the (interactive) xdb command "z 22 sr" at the "xdb>" prompt. This turns off xdb interception of I / O signals (signal #22).

Series 90 CPUs Limit Amount of Memlist Data

When using the Host Communications Toolkit (HCT) or Host Drivers software to communicate with a Series 90 PLC CPU, each CPU has restrictions to the amount of data in an HCT memlist. The limit for the Series 90-70 PLC CPU is two hundred and fifty-six (256) points in a list. The current limit for the Series 90-30 PLC CPU is two hundred and fifty-six (256) bytes of data being returned in a single memlist. Future releases of Series 90-30 CPU firmware will expand this limitation to match that of the Series 90-70 PLC. This release of the HCT software will return an error message to the HCT user before sending any messages to the PLC CPU if the memlist data exceeds 256 bytes and the Series 90-30 CPU cannot handle more. By upgrading your Series 90-30 CPU at a later time, this same HCT software will expand the amount of memlist data allowed by recognizing the more capable CPU firmware.

Winsock-Compliant DLL Required for Windows for Workgroups Products

A Winsock-compliant Dynamic Link Library (DLL) to provide the TCP / IP communications stack is required for the following products:

- *Host Communications Drivers for Windows*™ (IC641SWP050, IC641SWP051)
- *Toolkit for Windows*™ *C/C++ Applications* (IC641SWP052)
- *Toolkit for Windows*™ *Visual Basic Applications* (IC641SWP055)

GE Fanuc recommends the use of the Windows for Workgroups operating system, which comes with the right to obtain a copy of Microsoft's Winsock-compliant DLL. The customer may call the Microsoft Corporation at (206) 882-8080 to obtain a copy of the DLL. Microsoft's name for this product is "Microsoft TCP / IP-32 for Windows for Workgroups". To obtain this TCP / IP software from Microsoft, you may choose one of the following options:

1. Microsoft Sales at 800-426-9400. Order a floppy disk (approximate price $10) to be mailed to your address.
2. Microsoft DownLoad Service (MSDL) at 206-936-6735. This is available 24 hours a day, 7 days a week. No subscription or access fee. Requires a PC with modem and communications software (such as CrossTalk).
3. Access the FTP account FTP.MICROSOFT.COM with a user name of "anonymous". Move to the peropsys / windows / wfw directory. The file name is WFWT32.EXE.

The customer should verify that the Winsock TCP / IP DLL is working properly by consulting the DLL vendor's installation and start-up documentation before installing any of the GE Fanuc software products listed above. Microsoft provides *.TXT and *.HLP help files with their "Microsoft TCP / IP-32 for Windows for Workgroups" product. In particular, it is recommended that a PING command be successful in both directions (PC to PLC, and PLC to PC) as part of this verification before installing the GE Fanuc Toolkit software.

Special Operational Notes

Trace Debug Output Capability Added

For the HP-UX 9000 (IC641SWP054), DEC VAX / VMS (IC641SWP053), and DEC Alpha AXP / VMS (IC641SWP057) platforms, there is now an additional Host Communications Toolkit (HCT) library in the distribution medium. In addition to the normal HCT library for use in your development and production environments, there is also a "trace debug" library. This library produces debug printouts (to the standard output, stdout and SYS$OUTPUT) which can greatly assist in troubleshooting an HCT problem.

Note that it is not intended that the trace debug library be included in any production executable. This special library is to be used only when other debugging efforts have failed.

"C" Compiler Toolkit Added to DEC Alpha

The DEC Alpha AXP / VMS toolkit (IC641SWP057) was originally released with a library built using the DEC C++ (CXX) compiler. This proved to be a problem with applications compiled using the DEC "C" (CC) compiler, due to DEC's "name mangling" feature of the C++ compiler. This release provides both a "C" library and a C++ library.

Logical Configuration File Name Available on HP and DEC

For the HP-UX 9000 (IC641SWP054), DEC VAX / VMS (IC641SWP053), and DEC Alpha AXP / VMS (IC641SWP057) platforms, you may now use (new with this release) the logical name GEF_CFG_INI (upper case) as a "logical name" for the GEF_CFG.INI configuration file. On the HP-UX 9000, you must enter a line similar to ...

```
ln -s /home/xyz/gef_cfg.ini GEF_CFG_INI
```

... to create the symbolic link. You may then enter ...

```
rm GEF_CFG_INI
```

... to delete the symbolic link.

On the DEC / VMS systems, you must enter a line similar to ...

```
ASSIGN disk:[abc.xyz]gef_cfg.ini GEF_CFG_INI
```

... to create the logical name. You may then enter ...

```
DEASSIGN GEF_CFG_INI
```

... to delete the logical name.

If the logical name GEF_CFG_INI is defined, then the file it points to will be used. If the logical name is not defined, then the file GEF_CFG.INI must be in the local directory.

Timeout Values for Windows Expanded

In the configuration file GEF_CFG.INI there are two timeout values that are configurable by the user. Both of these timers originally had an upper limit of ten (10) seconds. This release expands the maximum configurable value for both timers to sixty-three (63) seconds. The minimum and default timeout values remain unchanged.

DEC TCP Feature Must Be Disabled

When using the *Toolkit for DEC VAX/VMS C Applications* (IC641SWP053) or the *Toolkit for DEC Alpha AXP/VMS C/C++ Applications* (IC641SWP057), you must turn off a DEC TCP option to allow compatibility with the GE Fanuc IC697 TCP / IP Ethernet software (IC651ENS042). The DEC TCP / IP for OpenVMS command to give to turn off this option on a running system is the following:

```
UCX SET PROTOCOL TCP /NOWINDOW_SCALE
```

To turn off this option in the DEC / VMS configuration, use the following command:

```
UCX SET CONFIG PROTOCOL TCP /NOWINDOW_SCALE
```

Tallies Added to All Platforms

All Host Communications software products included in this release (excludes IC641SWP055) have a new feature referred to as “tallies”. These are counters within the Host Communications Toolkit (HCT) and Host Driver software. Events being counted include the number of calls to each HCT interface routine as well as certain abnormal conditions. These tallies are always being maintained by the HCT and Host Driver software. If your HCT application encounters any problems, these tallies will provide useful information to GE Fanuc.

In the Microsoft Windows for Workgroups environment (IC641SWP050, IC641SWP051, IC641SWP052), the “Host Drivers” icon (formerly the “SRX Driver” icon) has a new menu. The Host Drivers program still has the *Version* and *Quit* menu items it has always had. In addition to that, there is now a *Tallies* menu. If you click on *Tallies*, you get two items to select from in a submenu: *View* brings up a dialog box displaying the current values of the tallies, and *Clea*r resets all the tallies to zero.

All host platforms (except IC641SWP055) also now have two new HCT interface routines. See the section “Changes to the User’s Manual” for details on these new routines.

Problems Corrected

This section describes the software defects that have been corrected since the previous release of these products.

Problems corrected with the Host Communications Toolkit for Windows C/C++, version 1.15 (IC641SWP052):

Subject	ID Code	Description
Toolkit does not see session come down	**27739, 30353**	HCT would pass an error message to the HCT user saying session had terminated, but still allow more requests on that session.
Independent applications affecting each other's timers	**29047**	HCT applications were seeing longer than configured timeouts because a second application was affecting the HCT timers for the first application's request.
Sample program does not show unknown error codes	**29641**	If the toolkit sample program encounters a toolkit error code it does not know, it prints the message "Unknown SRX error" without displaying the actual code.
If PLC disconnects, toolkit does not notify application	**30085**	If a TCP connection is disconnected by the remote (PLC) side, the toolkit did not notify the HCT application of this fact.
Cannot read PLC master checksum	**30144**	HCT applications had no way of obtaining the PLC checksums for the ladder program or configuration. See Chapter 3 of the user's manual for more details.
HCT_connect returns session ID of zero	**30328**	When using a non-blocking call to HCT_connect when the target device was not operational, the HCT might return an invalid session ID of zero (0). Further calls to the HCT with this ID caused buffer corruption problems.
Reply timeouts sometimes occur	**30449**	If an HCT application is reading a large amount of data and using the event-driven non-blocking calling style, there may occasionally be times when the HCT response never arrives.
Application cannot connect if other application passing much data	**30450**	If one HCT application is transferring a large amount of data, a second HCT application on the same PC was not able to establish a connection. This was true whether the two applications were trying to communicate to the same or different PLCs.

Problems corrected in the Host Communications Drivers for Windows (IC641SWP050D/051D):

Subject	ID Code	Description
Toolkit does not see session come down	**27739, 30353**	HCT would pass an error message to the HCT user saying session had terminated, but still allow more requests on that session.
Independent applications affecting each other's timers	**29047**	HCT applications were seeing longer than configured timeouts because a second application was affecting the HCT timers for the first application's request.
If PLC disconnects, toolkit does not notify application	**30085**	If a TCP connection is disconnected by the remote (PLC) side, the toolkit did not notify the HCT application of this fact.
HCT_connect returns session ID of zero	**30328**	When using a non-blocking call to HCT_connect when the target device was not operational, the HCT might return an invalid session ID of zero (0). Further calls to the HCT with this ID caused buffer corruption problems.
Reply timeouts sometimes occur	**30449**	If an HCT application is reading a large amount of data and using the event-driven non-blocking calling style, there may occasionally be times when the HCT response never arrives.
Application cannot connect if other application passing much data	**30450**	If one HCT application is transferring a large amount of data, a second HCT application on the same PC was not able to establish a connection. This was true whether the two applications were trying to communicate to the same or different PLCs.

Problems corrected with the Host Communications Toolkit for Windows NT C/C++, version 1.02 (IC641SWP058):

Subject	ID Code	Description
Sample program window off screen for EGA/VGA	**26441**	If a PC monitor has less than Super VGA resolution, each sample program main menu window will have its right edge off the right-hand side of the screen.
Toolkit does not see session come down	**27739, 30353**	HCT would pass an error message to the HCT user saying session had terminated, but still allow more requests on that session.
Configured timeouts limited to 10 seconds	**28073**	The maximum value for either the Connect timeout or the Request timeout was 10 seconds. It has now been raised to 63 seconds.
Sample program does not show unknown error codes	**29641**	If the toolkit sample program encounters a toolkit error code it does not know, it prints the message "Unknown SRX error" without displaying the actual code, 30038.
Application crashes when two applications are running at the same time	**30038**	Occasionally when two applications are running simultaneously, one application crashes when connecting. This also happens if one application is bringing connections up and down while transferring a lot of data.
If PLC disconnects, toolkit does not notify application	**30085**	If a TCP connection is disconnected by the remote (PLC) side, the toolkit did not notify the HCT application of this fact.
Cannot read PLC master checksum	**30144**	HCT applications had no way of obtaining the PLC checksums for the ladder program or configuration. See Chapter 3 of the user's manual for more details.

Problems corrected in the Toolkit for HP-UX C Applications, version 1.04 (IC641SWP054):

Subject	ID Code	Description
Toolkit does not see session come down	**27739, 30353**	HCT would pass an error message to the HCT user saying session had terminated, but still allow more requests on that session.
Some read/write requests not returning event notification	**28017**	Attempts to use the event-driven non-blocking calling style returns no event when reading the list of subprogram blocks, clearing a fault table, or changing the PLC CPU RUN / STOP state.
Configured timeouts limited to 10 seconds	**28073**	The maximum value for either the Connect timeout or the Request timeout was 10 seconds. It has now been raised to 63 seconds.
Application hangs if ctrl-C entered	**28593**	Entering control-C to a running HCT application (connected to a PLC) causes the application to hang (not respond to keyboard) and use large percentage of HP CPU.
Getting program block list fails intermittently	**28963**	Attempts to read the PLC task name, then read the program block list using the returned value of the task name worked sometimes, but not always.
GEF_CFG.INI must abe in local directory	**29331**	Before logical names were allowed, the user was required to put the GEF_CFG.INI configuration file in the local directory for each executable.
Sample program does not show unknown error codes	**29641**	If the toolkit sample program encounters a toolkit error code it does not know, it prints the message "Unknown SRX error" without displaying the actual code.
Toolkit with "xdb" debugger not reliable	**29942**	The Toolkit does not always operate correctly when run under the "xdb" debugger facility. See the section "Special Operational Notes" for a user-applied solution.
Application crashes when two applications are running at one time	**30038**	Occasionally when two applications are running simultaneously, one application crashes when connecting. This also happens if one application is bringing connections up and down while transferring a lot of data.
If PLC disconnects, toolkit does not notify application	**30085**	If a TCP connection is disconnected by the remote (PLC) side, the toolkit did not notify the HCT application of this fact.
Cannot read PLC master checksum	**30144**	HCT applications had no way of obtaining the PLC checksums for the ladder program or configuration. See Chapter 3 of the user's manual for more details.
If host slow and PLC fast, lose responses	**30149**	Timing problem where application responses were lost (user sees timeouts) if the PLC responded before the host software had setup internal tables.
HCT_connect returns session ID of zero	**30328**	When using a non-blocking call to HCT_connect when the target device was not operational, the HCT might return an invalid session ID of zero (0). Further calls to the HCT with this ID caused buffer corruption problems.
Application not notified if connect fails	**30419**	HCT applications using the event-driven non-blocking calling style would not have their notification routine called by the HCT if the connect attempt failed after *HCT_connect()* returned control to the user application..

Problems corrected with the Host Communications Toolkit for DEC VAX/VMS C Applications, version 1.01 (IC641SWP053):

Subject	ID Code	Description
Toolkit does not see session come down	**27739, 30353**	HCT would pass an error message to the HCT user saying session had terminated, but still allow more requests on that session.
Configured timeouts limited to 10 seconds	**28073**	The maximum value for either the Connect timeout or the Request timeout was 10 seconds. It has now been raised to 63 seconds.
Getting program block list fails intermittently	**28963**	Attempts to read the PLC task name, then read the program block list using the returned value of the task name worked sometimes, but not always.
GEF_CFG.INI must abe in local directory	**29331**	Before logical names were allowed, the user was required to put the GEF_CFG.INI configuration file in the local directory for each executable.
Sample program does not show unknown error codes	**29641**	If the toolkit sample program encounters a toolkit error code it does not know, it prints the message "Unknown SRX error" without displaying the actual code.
If PLC disconnects, toolkit does not notify application	**30085**	If a TCP connection is disconnected by the remote (PLC) side, the toolkit did not notify the HCT application of this fact.
Cannot read PLC master checksum	**30144**	HCT applications had no way of obtaining the PLC checksums for the ladder program or configuration. See Chapter 3 of the user's manual for more details.
If host slow and PLC fast, lose responses	**30149**	Timing problem where application responses were lost (user sees timeouts) if the PLC responded before the host software had setup internal tables.

Problems corrected with the Host Communications Toolkit for DEC Alpha AXP/VMS C/C++ Applications, version 1.01 (IC641SWP057):

Subject	ID Code	Description
Toolkit does not see session come down	**27739, 30353**	HCT would pass an error message to the HCT user saying session had terminated, but still allow more requests on that session.
Toolkit assumes C++ calling conventions	**28019**	Users with a "C" compiler (CC) had difficulty linking with the Toolkit, which was compiled with C++ (CXX). There are now both a C Toolkit and a C++ Toolkit.
Configured timeouts limited to 10 seconds	**28073**	The maximum value for either the Connect timeout or the Request timeout was 10 seconds. It has now been raised to 63 seconds.
Getting program block list fails intermittently	**28963**	Attempts to read the PLC task name, then read the program block list using the returned value of the task name worked sometimes, but not always.
GEF_CFG.INI must abe in local directory	**29331**	Before logical names were allowed, the user was required to put the GEF_CFG.INI configuration file in the local directory for each executable.
Sample program does not show unknown error codes	**29641**	If the toolkit sample program encounters a toolkit error code it does not know, it prints the message "Unknown SRX error" without displaying the actual code.
If PLC disconnects, toolkit does not notify application	**30085**	If a TCP connection is disconnected by the remote (PLC) side, the toolkit did not notify the HCT application of this fact.
Sample program crashes on floating point read	**30140**	Sample program #1 would crash sometimes due to invalid data in PLC being interpreted as a floating point value.
Cannot read PLC master checksum	**30144**	HCT applications had no way of obtaining the PLC checksums for the ladder program or configuration. See Chapter 3 of the user's manual for more details.
If host slow and PLC fast, lose responses	**30149**	Timing problem where application responses were lost (user sees timeouts) if the PLC responded before the host software had setup internal tables.

Open Problems

Open Problems - Host Communications software in the Windows Environment

This section describes known limitations to the Host Communications software (IC641SWP050, IC641SWP051, IC641SWP052, and IC641SWP055) which operates in the Microsoft Windows for Workgroups environment.

Subject	ID Code	Description
No C++ sample programs	**26442**	There are no sample programs for IC641SWP052 written in C++ (object oriented programming). Only examples in C are provided.
No online help yet available	**26497**	There is no online help.
DOS installation attempt not prevented	**26840**	These software products are made to be installed from Microsoft Windows, and not from DOS. Unfortunately, the installation program does not prevent the user from attempting to install from DOS, the installation does not work, and the DOS user is left in Windows setup mode.

Open Problems - Windows NT

This section describes known limitations to the Microsoft Windows NT Host Communications software (IC641SWP058).

Subject	ID Code	Description
No C++ sample programs	**26442**	There are no sample programs written in C++ (object oriented programming). Only examples in C are provided.
Non-blocking calls not supported.	**26464**	Neither of the non-blocking calling methods are supported in the Windows NT version of the Host Communications Toolkit.
No online help yet available	**26497**	There is no online help.
PC CPU usage high when PLC turned off	**28016**	When the HCT application is taking connections up and down, and there is an outstanding request when the PLC CPU is turned off, the HCT uses a high percentage of the PC CPU cycles until the last request times out.

Open Problems - HP-UX 9000

This section describes known limitations to the HP-UX 9000 Host Communications software (IC641SWP054).

Subject	ID Code	Description
Connect to non-existent station has long timeout	**26458**	If a connect request is made to a remote node that is not there (no response to local HP host), the default HP timeout value can be five (5) or more minutes. During this interval, the HP application will appear to be hung up.
No online help yet available	**26497**	There is no online help.
Trace output wrong for some messages	**30240**	Using the trace debug HCT library, incoming messages with a separate buffer holding external data will be displayed as the same 32-byte message twice.

Open Problems - DEC VAX/VMS

This section describes known limitations to the DEC VAX / VMS Host Communications software (IC641SWP053).

Subject	ID Code	Description
Non-blocking calls not supported.	**26464**	Neither of the non-blocking calling methods are supported in the DEC VAX / VMS version of the Host Communications Toolkit.
No online help yet available	**26497**	There is no online help.
Trace output wrong for some messages	**30240**	Using the trace debug HCT library, incoming messages with a separate buffer holding external data will be displayed as the same 32-byte message twice.

Open Problems - DEC Alpha AXP/VMS

This section describes known limitations to the DEC Alpha AXP / VMS Host Communications software (IC641SWP057).

Subject	ID Code	Description
No C++ sample programs	**26442**	There are no sample programs written in C++ (object oriented programming). Only examples in C are provided.
Non-blocking calls not supported.	**26464**	Neither of the non-blocking calling methods are supported in the DEC Alpha AXP / VMS version of the Host Communications Toolkit.
No online help yet available	**26497**	There is no online help.
Trace output wrong for some messages	**30240**	Using the trace debug HCT library, incoming messages with a separate buffer holding external data will be displayed as the same 32-byte message twice.

Changes to the User's Manual

GFK-0870A Host Communications Toolkit for C/C++ Applications User's Manual

Chapter 2, Installation, Section 3, page 2-15 (Contents of HP-UX distribution tape):

The contents of the HP-UX distribution tape has been modified to include trace debug libraries. The new HP-UX distribution tape will contain the following files:

libhct.a libtrace.a	Libraries containing the Host Communications Toolkit software. One of these libraries must be linked in with the user application to create the user's executable. The *libhct.a* library is the primary library to be used in a production environment. The *libtrace.a* library is only for troubleshooting environments.
gef_hct.h	The C language include file that defines the various constants and structures used by user applications which are interfacing with the Toolkit.
gef_cfg.ini	A sample configuration file that ties a remote PLC's "Device Name" to its IP address. The format for an address record is described within the file itself.
main1.c main2.c main3.c main4.c hctutil.c hctsamp.h	Source code for sample application programs that use the Toolkit routines. The first three sample programs demonstrate each of the possible calling styles (main1 - blocking, main2 - event non-blocking, main3 - polling non-blocking). main4 demonstrates all interface routines.
hcttst1 hcttst2 hcttst3 hcttst4	Executable sample application programs which use the *libhct.a* library.
hcttrc1 hcttrc2 hcttrc3 hcttrc4	Executable sample application programs which use the *libtrace.a* library.
makefile	A sample makefile that pulls together the main*.c applications and the Toolkit into the executables hcttst* and hcttrc*.

Chapter 2, Installation, Section 4, page 2-18 (Installing the DEC/VMS Toolkits):

The Toolkit and Ethernet communications driver are distributed on a TK50 tape. Insert the tape into the TK50 drive. Set your default directory to your working directory.

- For a DEC Alpha AXP / VMS release tape, enter a command similar to the following:

  ```
  $ BACKUP/REW/LOG tape$drive:HCTxyz.BCK/SEL=[*...] disk:[abc.xyz...]
  ```

  ... where "tape$drive" is the name of your TK50 tape drive device and "disk:[abc.xyz]" is your working directory. "HCTxyz.BCK" is the tape label, where "xyz" is the Toolkit version number. For example, for Toolkit version 1.01, the tape label would be "HCT101.BCK".

- For a DEC VAX / VMS release tape, enter a command similar to the following:

  ```
  $ BACKUP/REW/LOG tape$drive:HCTxyz.BCK disk:[abc.xyz...]
  ```

  ... where "tape$drive" is the name of your TK50 tape drive device and "disk:[abc.xyz]" is your working directory. "HCTxyz.BCK" is the tape label, where "xyz" is the Toolkit version number. For example, for Toolkit version 1.01, the tape label would be "HCT101.BCK".

Chapter 2, Installation, Section 4, page 2-18 (Contents of DEC/VMS distribution tapes):

The contents of the DEC VAX / VMS and DEC Alpha AXP / VMS distribution tapes has been modified to include trace debug libraries. The DEC Alpha AXP / VMS distribution tape also now has a C language library and a C++ language library. The new DEC / VMS distribution tapes will be changed to the following:

The DEC VAX / VMS distribution tape includes the following files:

HCTREL.OLB HCTTRC.OLB	Libraries containing the Host Communications Toolkit software. One of these libraries must be linked in with the user application to create the user's executable. The HCTREL.OLB library is the primary library to be used in a production environment. The HCTTRC.OLB library is only for troubleshooting environments.
MAIN1.C MAIN4.C HCTUTIL.C	Source code for sample application programs that use the Toolkit routines. MAIN1.C demonstrates the basic use of the Toolkit interface routines to read PLC memory. MAIN4.C demonstrates all interface routines.
GEF_HCT.H	The C language include file that defines the various constants and structures used by user applications which are interfacing with the Toolkit.
GEF_CFG.INI	A sample configuration file that ties a remote PLC's "Device Name" to its IP address. The format for an address record is described within the file itself.
SAMPLE1.EXE SAMPLE4.EXE	Executable sample application programs which use the HCTREL.OLB library.
TRACE1.EXE TRACE4.EXE	Executable sample application programs which use the HCTTRC.OLB library.
MAKE.COM	A sample COMfile that pulls together the main*.c applications and the Toolkit into the executables SAMPLE*.EXE and TRACE*.EXE.

The DEC Alpha AXP / VMS distribution tape contains two directories: [.DEC_C] for the C compiler Toolkit and [.DEC_CPP] for the C++ compiler Toolkit. The [.DEC_C] directory on the Alpha AXP distribution tape includes the following files:

HCTRELC.OLB HCTTRCC.OLB	Libraries containing the Host Communications Toolkit software. One of these libraries must be linked in with the user application to create the user's executable. The HCTRELC.OLB library is the primary library to be used in a production environment. The HCTTRCC.OLB library is only for troubleshooting environments.
MAIN1.C MAIN4.C HCTUTIL.C	Source code for sample application programs that use the Toolkit routines. MAIN1.C demonstrates the basic use of the Toolkit interface routines to read PLC memory. MAIN4.C demonstrates all interface routines.
GEF_HCT.H HOSTDRV.H	The C language include file that defines the various constants and structures used by user applications which are interfacing with the Toolkit.
GEF_CFG.INI	A sample configuration file that ties a remote PLC's "Device Name" to its IP address. The format for an address record is described within the file itself.
SMPL1C.EXE SMPL4C.EXE	Executable sample application programs which use the HCTRELC.OLB library.
TRSMP1C.EXE TRSMP4C.EXE	Executable sample application programs which use the HCTTRCC.OLB library.
MAKE.COM	A sample COMfile that pulls together the main*.c applications and the Toolkit into the executables SMPL*C.EXE and TRSMP*C.EXE.

The [.DEC_CPP] directory on the Alpha AXP distribution tape includes the following files:

HCTRELCP.OLB HCTTRCCP.OLB	Libraries containing the Host Communications Toolkit software. One of these libraries must be linked in with the user application to create the user's executable. The HCTRELCP.OLB library is the primary library to be used in a production environment. The HCTTRCCP.OLB library is only for troubleshooting environments.
MAIN1.C MAIN4.C HCTUTIL.C	Source code for sample application programs that use the Toolkit routines. MAIN1.C demonstrates the basic use of the Toolkit interface routines to read PLC memory. MAIN4.C demonstrates all interface routines.
GEF_HCT.H HOSTDRV.H	The C language include files that defines the various constants and structures used by user applications which are interfacing with the Toolkit.
GEF_CFG.INI	A sample configuration file that ties a remote PLC's "Device Name" to its IP address. The format for an address record is described within the file itself.
SMPL1CP.EXE SMPL4CP.EXE	Executable sample application programs which use the HCTRELCP.OLB library.
TRSMP1CP.EXE TRSMP4CP.EXE	Executable sample application programs which use the HCTTRCCP.OLB library.
MAKE.COM	A sample COMfile that pulls together the main*.c applications and the Toolkit into the executables SMPL*CP.EXE and TRSMP*CP.EXE.

Chapter 3, Programming Considerations, Section 2, page 3-19 (description of CTLINFO structure):

The correct structure for this request is as follows ...

```
struct chksum {
    unsigned short num_pblocks;   /* Number of program blocks        */
    long           tot_prg_len;   /* Byte length of control program  */
    unsigned short prg_add_chk;   /* Sum of prg blk additive chksums */
    unsigned long  prg_crc_chk;   /* Sum of prg blk CRC checksums    */
    unsigned short tot_cfg_len;   /* Byte length of config records   */
    unsigned short cfg_add_chk;   /* Sum of config additive chksums  */
    unsigned long  cfg_crc_chk;   /* Sum of config CRC checksums     */
              };

struct control_info {
    char          SNPid[8];       /* CPU controller ID          */
    unsigned char cpu_major_type; /* Series 90-70, 90-30, 90-20 */
    unsigned char cpu_minor_type; /* CPU 731 or 331 or 914, etc */
    unsigned char NumCtlProgs;    /* Number of control programs */
    unsigned char reserved;
    char          TaskName[8];    /* Name of main ctl program   */
    struct chksum checksums;      /* PLC master checksum record */
                  };
```

Note that the previous documentation omitted the "NumCtlProgs" field, although it was present in the GEF_HCT.H include file that comes with the toolkit. In addition, we now define the master PLC checksum record.

Chapter 3, Programming Considerations, Table 3-6, page 3-19 (PLC Majuor and Minor Type Codes):

Add the following codes to the table:

Major Type		Description	Minor Type		Description
Dec	Hex		Dec	Hex	
12	0Ch	Series 90-70 PLC CPU	15	0Fh	Series 90-70 Model 915 CPU
			25	19h	Series 90-70 Model 925 CPU
16	10h	Series 90-20 PLC CPU	31	1Fh	Series 90-20 Model 211 CPU
16	10h	Series 90-30 PLC CPU	30	1Eh	Series 90-30 Model 311 CPU
			32	20h	Series 90-30 Model 321 CPU
			33	21h	Series 90-30 Model 313 CPU
			34	22h	Series 90-30 Model 323 CPU
			35	23h	Series 90-30 Model 331 CPU
			36	24h	Series 90-30 Model 341 CPU
			37	25h	Series 90-30 Model 351 CPU
			38	26h	Series 90-30 Model 340 CPU

Chapter 4, Interface Routine Descriptions, page 4-14 (bottom of example for HCT_estab_mem_list interface routine):

Replace “HCT_write_req” with “HCT_estab_mem_list”.

Chapter 4, Interface Routine Descriptions, Local Host Support Routines (new routines):

The following two new routines are to be added:

HCT_get_tallies

This routine is called to retrieve a snapshot of the current values of the Host Communications Toolkit (HCT) tallies.

Windows Calling Sequence

```
int  HCT_get_tallies (
  TALLIES far  *  TallyPtr  )
```

Non-Windows Calling Sequence

```
int  HCT_get_tallies (
  TALLIES  *  Tally Ptr  )
```

Tally Ptr Pointer to a buffer to hold the HCT tally values. The structure of this buffer is defined in GEF_HCT.H.

This routine will return a value of HCT_NULL if the *TallyPtr* parameter is NULL. Otherwise the return value will be HCT_OK.

HCT_clear_tallies

This routine is called to reset all HCT tally counters to zero(0).

Calling Sequence

```
int HCT_clear_tallies ( )
```

This routine always returns a value of HCT_OK.

Appendix A, Toolkit Error Codes, Table A-8, page A-6 (PLC CPU Error Codes):

Add the following error codes to the table of errors that may be returned from a Series 90 PLC CPU:

Error Code	Service Request Error Description
0100h	Illegal service request code.
0205h	Insufficient privilege level - read-only access allowed.
02fch	Insufficient privilege level - debug session active.
02fdh	Insufficient privilege level - memory restricted.
02feh	Insufficient privilege level - access denied due to keyswitch.
02ffh	Insufficient privilege level - access denied due to OEM protection.
0300h	Service request protocol timeout.
0400h	Service request protocol sequence error.
0600h	Illegal service request traffic type.
07ffh	Service request queues full, try later
07feh	Waiting for transfer traffic from another device.
07fdh	Another device owns the semaphore for a single execution request.
07fch	Memory read or write blocking this request.
07fbh	Already waiting for service response.
0800h	Service request queue overflow.
0900h	CPU busy with transfer from another device.

Appendix A, Toolkit Error Codes, Table A-9, page A-8 (Winsock Error Codes):

Add the following error codes to the table of errors that may be returned from the Microsoft Windows for Workgroups TCP/IP stack:

Error Code		Request Error Description
Decimal	Hexadecimal	
10022	2726	Invalid parameter passed to the Winsock interface.